

Worrying Alone: Shyness as the Bridge Between Anxious Thought and Solitude

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ABSTRACT – Worry, shyness, and preference for solitude represent interconnected facets of emotional and social functioning. This study examined whether shyness mediates the relationship between worry and the motivation to spend time alone. A sample of 150 adults completed the Worry Domains Questionnaire, the Cheek and Buss Shyness Scale, and the Preference for Solitude Scale. Results revealed that worry predicted higher shyness, which in turn predicted greater preference for solitude, whereas the direct path from worry to solitude was nonsignificant. Mediation remained robust when controlling age and gender. Exploratory analyses indicated that confidence- and future-oriented worry were most strongly associated with shyness while future and relationship worry were most associated with solitude. These findings highlight shyness as a key psychological mechanism linking cognitive vulnerability to social withdrawal tendencies. Implications for understanding adaptive versus avoidant solitude within individual differences research are discussed.

Keywords:

Worry; Shyness; Solitude; Social withdrawal; Individual differences; Mediation; Social anxiety

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Introduction

Worry, shyness, and preference for solitude are central features of personality and emotional life, yet their interrelations remain incompletely understood. Worry—defined as a chain of negative, uncontrollable thoughts about potential future threats (Borkovec et al., 1998)—has long been recognized as a core cognitive feature of anxiety. Shyness, by contrast, is a socioemotional trait reflecting discomfort and self-consciousness in social contexts (Cheek & Buss, 1981). While both constructs share an anxious tone, they differ in scope: worry is largely cognitive and domain-

general, whereas shyness is interpersonal and behaviorally expressed through avoidance or inhibition. Preference for solitude represents a related but distinct outcome, encompassing motivational tendencies to seek time alone, which can be either adaptive (restorative, reflective) or maladaptive (avoidant) (Burger, 1995; Coplan et al., 2019). Emerging daily-diary work further shows that the *effects* of time alone depend on motivation—choiceful, autonomous solitude tends to buffer costs and support well-being, whereas unchosen solitude relates to more loneliness and lower day satisfaction (Weinstein et al., 2023). Understanding how worry translates into solitude preference therefore requires examining the affective and social mechanisms that mediate this relationship and the motivational contexts in which solitude occurs.

Theoretical models of worry, such as the Avoidance Theory of Worry (Borkovec et al., 2004), conceptualize it as a maladaptive strategy for coping with uncertainty and perceived threats. Although worry often targets practical life domains such as work, finances, or relationships (Tallis et al., 1992), it also has affective and interpersonal consequences. Chronic worriers may experience heightened anxiety, self-doubt, and hypervigilance, which can influence social behavior. However, worry's influence on social outcomes is indirect: some individuals maintain active social engagement, whereas others develop social reticence or shyness. Identifying the mechanisms linking worry to social withdrawal is therefore essential. Recent evidence also cautions that a *preference* for solitude does not necessarily protect mental health during periods of social isolation—indeed, higher solitude preference can couple with more distress and loneliness when socializing feels troublesome (Sakurai et al., 2024), underscoring the importance of the *quality* and *drivers* of alone time.

Recent work suggests that protective psychological factors may buffer against worry, highlighting the importance of considering both risk and resilience in models of social withdrawal. For example, self-actualization, a construct reflecting authenticity, autonomy, and purposeful engagement, has been shown to predict lower overall worry (Bai, 2015). In addition, person-level resources like trait mindfulness can shape momentary solitude experiences—certain mindfulness facets (e.g., nonreactivity, acting with awareness) appear to attenuate negative affective shifts during time alone (Peng et al., 2025). Integrating such protective traits underscores that while worry can contribute to maladaptive outcomes like shyness and preference for solitude, individual differences in positive functioning may moderate or reduce these downstream effects, offering potential targets for intervention.

Shyness is characterized by social self-consciousness and discomfort in evaluative or unfamiliar social situations (Cheek & Buss, 1981; Henderson et al., 2014). It encompasses both affective components (fear of negative evaluation, anxiety) and behavioral components (reticence, avoidance). Individuals who experience high levels of worry, particularly about competence, social evaluation, or future uncertainty, may be more prone to shyness, which then shapes their social motivations and behavior. Shyness may thus serve as a proximal affective bridge, translating general cognitive vulnerability into observable withdrawal or solitude-seeking tendencies (Heiser et al., 2003; Schmidt & Fox, 1999).

Preference for solitude captures individual differences in the motivation to spend time alone, which can range from adaptive reflective solitude to maladaptive social withdrawal (Burger, 1995; Long & Averill, 2003). Shyness is consistently associated with increased preference for solitude, particularly when solitude serves as a coping strategy for social discomfort (Cheek & Buss, 1981; Lay et al., 2019). By contrast, general worry alone may not lead to solitude unless it manifests as social anxiety or self-consciousness. This distinction suggests that shyness may mediate the relationship between worry and solitude preference, with social affect as the key mechanism.

The multidimensional nature of worry provides an additional lens for understanding its social consequences. The Worry Domains Questionnaire (Tallis et al., 1992) identifies several domains—

including confidence, relationships, work, finances, and aimless future—that reflect different life concerns. Socially and existentially oriented worries, particularly confidence and relationships, may be more strongly linked to shyness and solitude than other domains. Examining domain-level associations allows for a more nuanced understanding of how specific worries influence social affect and behavioral tendencies.

Although shyness and worry peak in adolescence and early adulthood (Coplan & Armer, 2007), both may persist across the lifespan. Age may shape the meaning and consequences of solitude: younger adults may experience solitude as social avoidance, whereas older adults often view it as restorative (Nikitin et al., 2022). Gender differences in worry and shyness are generally small and inconsistent (Crozier, 2005) but including both variables as covariates ensures the robustness of the proposed model across demographic groups.

The present study examined a mediation model in which shyness mediates the relationship between general worry and preference for solitude. Based on theory and prior research, the study tested the following hypotheses: Higher levels of general worry will be positively associated with shyness (H1). Shyness will be positively associated with preference for solitude (H2). Shyness will mediate the relationship between worry and preference for solitude, such that worry indirectly predicts greater solitude through higher shyness (H3).

By integrating cognitive, affective, and motivational components of personality, the study aims to clarify the psychological pathway linking general worry to social withdrawal tendencies. Understanding this pathway has both theoretical and practical implications, helping distinguish between adaptive solitude and withdrawal motivated by social anxiety.

Method

Participants

Participants were 150 adults (87 women, 63 men), recruited from undergraduate and graduate social science courses who completed questionnaires for course credit. The average age was 23.04 ($SD = 7.18$).

Measures

Worry. Worry was measured using the Worry Domains Questionnaire (WDQ; Tallis et al., 1992), a 25-item scale assessing how often respondents worry across five domains: relationships, lack of confidence, aimless future, work, and finances. Items are rated on a 5-point Likert scale (1 = *not at all* to 5 = *extremely*). Higher scores indicate more everyday worry. The WDQ has shown good internal consistency and test–retest reliability in both clinical and nonclinical samples (Hong, 2007; Startup & Erickson, 2006).

Shyness. Shyness was assessed using the Cheek and Buss Shyness Scale (Cheek & Buss, 1981), a 13-item self-report measure of social inhibition and discomfort in social situations. Responses are made on a 5-point Likert scale (1 = *very uncharacteristic* to 5 = *very characteristic*). Higher scores indicate more shyness. The scale demonstrates good reliability and validity across diverse samples (Crozier, 2005; Cheek & Melchior, 1990).

Preference for solitude. Preference for solitude was measured using Burger's (1995) 12-item Preference for Solitude Scale, which assesses individual differences in the motivation to spend time alone. For each item participants choose one of two statements which best describe them. Total scores indicate more preference for solitude. The scale has demonstrated good internal consistency and construct validity across age groups and cultures (Thomas & Azmitia, 2019; Lay et al., 2019). Given contemporary findings that the motivation and momentary context of solitude matter for its affective consequences (Weinstein et al., 2023; Peng et al., 2025), preference-for-

solitude scores are interpreted alongside shyness as indicators of potential avoidance-driven versus autonomy-driven solitude.

Procedure

After providing consent, participants completed the WDQ, Shyness Scale, and Preference for Solitude Scale, followed by demographic questions. Questionnaires were administered via a secure online platform. A small amount of course credit was provided in exchange for participation. Participants also provided demographic information reporting age and gender. All procedures complied with institutional ethical standards and informed consent was obtained.

Statistical Analyses

We first examined descriptive statistics, internal consistencies, and zero-order (Pearson) correlations among variables. Mediation was tested using ordinary least squares regression with bootstrapped confidence intervals (5,000 resamples) following PROCESS Model 4 (Hayes, 2013). Age and gender were entered as covariates in follow-up models. Exploratory analyses correlated WDQ domains with shyness and solitude, and a hierarchical regression tested the incremental validity of shyness beyond worry in predicting solitude.

Results

Preliminary analyses

Descriptive statistics, internal consistencies, and zero-order correlations are presented in Table 1. All three measures demonstrated good internal consistency. Worry was positively correlated with shyness. Shyness was positively correlated with preference for solitude. Worry and preference for solitude were weak and nonsignificant.

Table 1: Descriptive statistics and correlations among main variables

Variable	1	2	<i>M</i>	<i>SD</i>	α
1. Worry			52.46	15.57	.918
2. Shyness	.53*		33.73	9.97	.899
3. Preference for Solitude	.15	.29*	5.61	2.7	.731

Note: $N = 150$. * $p < .001$

Mediation Analysis

Using PROCESS Model 4 (Hayes, 2013), worry significantly predicted shyness ($\beta = .49$, $B = .32$, $SE = .05$, $t = 6.76$, $p < .001$, 95% CI [.22, .41]). Shyness predicted preference for solitude controlling for worry ($\beta = .28$, $B = .08$, $SE = .03$, $t = 3.08$, $p = .003$, 95% CI [.02, .13]). The indirect effect of worry on solitude via shyness was significant ($\beta = .14$, 95% CI [.04, .24]); the direct effect of worry on preference for solitude was nonsignificant ($\beta = .01$, $p = .95$).

Supplementary Analyses

Gender and age did not significantly predict shyness; age showed a small positive association with solitude ($\beta = .19$, $p = .020$). The indirect effect remained robust when covariates were included ($\beta = .13$, 95% CI [.03, .23]).

Correlations between the five WDQ domains (relationships, confidence, aimless future, work, and finances) and shyness indicated that all domains were significantly related to shyness. Confidence worry was most strongly associated with shyness ($r = .61$, $p < .001$), followed by aimless future ($r = .48$, $p < .001$), relationships ($r = .41$, $p < .001$), work ($r = .31$, $p < .001$), and

finances ($r = .22, p = .008$). In contrast, only aimless future ($r = .19, p = .023$) and relationships ($r = .18, p = .028$) domains were significantly correlated with preference for solitude.

In hierarchical regression examining incremental influences of shyness on solitude beyond worry, worry alone explained a nonsignificant amount of variance in preference for solitude, $R^2 = .02, p = .081$. Adding shyness incrementally increased variance explained in preference for solitude, $\Delta R^2 = .061, p = .002$.

Discussion

The present study examined the relationships among worry, shyness, and preference for solitude in a diverse university student sample. As hypothesized, higher levels of general worry were associated with greater shyness, and shyness in turn predicted a stronger preference for solitude. Importantly, worry did not directly predict solitude when shyness was accounted for, indicating that the tendency to withdraw socially may emerge primarily through the experience of shyness rather than from worry itself. This pattern dovetails with longitudinal research showing that social-evaluative anxiety processes can set the stage for later loneliness and reduced social connection (Reinwarth et al., 2024), helping to locate shyness as a proximal mechanism through which cognitive vulnerability translates into socially avoidant solitude.

The significant indirect effect of worry on solitude through shyness suggests that individuals high in worry may develop social reticence as part of a broader hypervigilant style, which then shapes their social motivations and preferences. Consistent with prior research, worry represents a pervasive form of cognitive anxiety that generalizes across multiple life domains (Tallis et al., 1992). When chronic worry is oriented toward social or evaluative situations, it may foster the self-conscious apprehension characteristic of shyness (Cheek & Buss, 1981; Henderson et al., 2014). Moreover, contemporary work indicates that day-to-day solitude carries both risks and benefits: more time alone than usual tends to co-occur with lower day satisfaction and more loneliness, yet also with lower stress and higher autonomy—especially when solitude is choiceful (Weinstein et al., 2023). These findings jointly suggest that the *motivational* tone of solitude (autonomous vs. avoidant) is crucial for interpreting shyness-linked solitude seeking.

The absence of a direct relationship between worry and solitude is theoretically meaningful. While worry involves mental engagement with potential threats, solitude preference reflects a motivational stance toward the social world. Worry alone does not necessarily drive individuals away from others; rather, the self-conscious component of shyness appears to convert anxious cognition into behavioral withdrawal. This supports contemporary interactionist models of social inhibition, in which trait worry functions as a distal cognitive risk factor, while shyness serves as a proximal affective mechanism influencing real-world social behavior (Heiser et al., 2003; Schmidt & Fox, 1999).

Although the inclusion of age and gender did not appreciably alter the model, exploratory findings suggest subtle patterns worth noting. Gender did not significantly predict shyness or solitude... In contrast, age positively predicted preference for solitude, even within a primarily young adult sample. This finding aligns with research indicating that motivations for solitude evolve with age and are shaped by person-level resources: facets of mindfulness can amplify low-arousal positive experiences during time alone (Peng et al., 2025), whereas a mere *preference* for solitude does not necessarily buffer the mental-health costs of social isolation (Sakurai et al., 2024).

Exploratory correlations between the WDAQ subscales and shyness provided further insight into the social content of worry. All domains correlated positively with shyness but concerns about confidence and an aimless future had the strongest relationships. These domains may capture an

underlying sense of social inefficacy and uncertainty about one's trajectory—cognitive themes closely tied to self-evaluative anxiety and social self-doubt (Davey et al., 1992; Schwarzer, 1996). Only the relationships and aimless future domains related to solitude, suggesting that socially and existentially focused worry is most relevant to withdrawal tendencies. This pattern supports the idea that not all worry is equal in its interpersonal consequences; worry about competence and future direction may be especially linked to shyness and, indirectly, solitude.

The incremental validity analyses reinforced these conclusions. When shyness was entered into the model after worry, the explained variance in solitude increased significantly, and worry was no longer a significant predictor. This emphasizes that shyness contributes unique explanatory power beyond general negative affectivity or cognitive anxiety, highlighting its centrality in understanding solitude preferences.

Finally, recent studies on “casual contacts” (weak ties) show that social anxiety and loneliness can color everyday social micro-interactions; for some individuals high in these vulnerabilities, casual encounters are more likely to feel worse and to have lingering negative effects (Federman et al., 2024). This complements our interpretation that shyness channels worry into solitude seeking, partly by making routine social exchanges feel more taxing—thereby reinforcing avoidance-based solitude.

Taken together, these findings point toward a nuanced understanding of solitude-seeking behavior. Solitude has often been conceptualized along a continuum from maladaptive social withdrawal to restorative self-reflection (Burger, 1995; Long & Averill, 2003). The present results indicate that when solitude is preceded by worry and mediated by shyness, it may reflect avoidance-based withdrawal rather than positive solitude. Shy individuals may desire social connection yet anticipate negative evaluation, leading to ambivalent solitude marked by both relief and loneliness (Coplan et al., 2019). In contrast, non-anxious solitude preference—rooted in autonomy rather than avoidance—may arise from different personality antecedents such as introversion or openness (Goossens, 2014). The current findings therefore clarify one pathway through which cognitive–affective vulnerabilities translate into social behavior.

Despite its strengths, several limitations of the current study warrant consideration. The cross-sectional design precludes causal inference; longitudinal studies could better clarify the temporal sequence linking worry, shyness, and solitude. The use of self-report measures may have introduced shared-method variance, though the strong internal reliabilities of the instruments partly mitigate this concern. The sample, while diverse in age and educational level, was drawn from social science students and may not generalize to clinical or older adult populations where worry and solitude motivations differ. Future work might incorporate behavioral or ecological momentary assessment approaches to capture context-dependent expressions of solitude and social avoidance.

Future studies should also examine moderators such as trait mindfulness, social connectedness, or self-compassion, which may buffer the link between shyness and solitude. Moreover, distinguishing between adaptive and maladaptive solitude motivations could yield a more complete understanding of when solitude serves as a coping strategy versus a retreat from social anxiety.

The present findings provide novel evidence that worry relates to solitude preference indirectly through shyness. This mediation highlights shyness as a key mechanism translating general cognitive–emotional vulnerability into patterns of social withdrawal. By identifying this pathway, the study contributes to broader efforts within individual differences research to trace the psychological routes from anxious cognition to behavior. Understanding these routes may inform interventions aimed at reducing maladaptive solitude and promoting healthier forms of social engagement and self-regulation.

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